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ANNUAL REPORT

1961

TOWN OF RICHMOND HILL

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Richmond Hill : sewage
treatment plant.

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ANNUAL REPORT

ON

TOWN OF RICHMOND HILL

SEWAGE TREATMENT PLANT

OWRC PROJECT - 57-S-6

RICHMOND HILL SEWAGE TREATMENT PLANT

OPERATED FOR

THE TOWN OF RICHMOND HILL

BY

THE ONTARIO WATER RESOURCES COMMISSION

Mr. A. M. Snider - Chairman
Dr. A. E. Berry - General Manager
Mr. D. S. Caverly - Assistant General Manager and Director of Plant Operations
Mr. B. C. Palmer - Assistant Director, Division of Plant Operations
Mr. M. B. Fielding - Project Engineer, Division of Plant Operations

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GENERAL

The Richmond Hill Sewage Treatment Plant consists of three activated sludge sewage treatment units in parallel and having a common influent works, each section being built as a separate stage of expansion.

The first stage consisted of a primary clarifier, aeration tanks, secondary clarifier, digester and sludge drying beds, built in 1951 and having a design capacity of 180,000 gallons per day.

The second stage, completed in 1956, and consisting of a primary clarifier, aeration tanks, secondary clarifier and chlorine contact chamber, has a design capacity of 450,000 gallons per day, thus expanding the plant capacity to a total of 630,000 gallons per day.

In 1958, the third stage expansion of the plant was completed. This expansion provided a new influent works, two primary clarifiers, each with a capacity of 42,000 gallons, four aeration tanks with a capacity of 75,000 gallons each, two secondary clarifiers with a capacity of 56,000 gallons each, a chlorine contact chamber, a 245,000 gallon digester, and an expansion of the sludge drying beds. This expansion is capable of treating 970,000 gallons of sewage per day (design flow) and increases the total plant capacity to 1.635 million gallons per day.

PLANT OPERATION

In 1961, only the 1958 expansion of the sewage treatment plant was used. In 1960, the flow exceeded the capacity of the third section of the plant 13% of the time, but with the construction of separate storm sewers in the Town the number of times the capacity of the third section was exceeded dropped considerably. In addition, the minum flows in 1961 became such that in October of this year one half of the aeration tanks in the third stage was taken out of service. Therefore, the sewage plant as it was operating at the end of 1961 consisted of the following:

2 primary clarifiers, 42,000 gallons each
2 aeration tanks, 75,000 gallons each
2 secondary clarifiers, 56,000 gallons each
2 digesters, primary 245,000 gallons
secondary 83,500 gallons
along with associated control appurtenances.

The cumulative flow for the year was 205.5 million gallons giving an average of 0.56 mgd. With two aeration tanks in service, four hours retention time is provided for 0.9 mgd. The average daily flow exceeded this figure in one week only during 1961. Six hours retention time is provided for 0.6 mgd and since October 1, this figures has not been exceeded by the average daily flow. On the basis of

recorded maximum flows, 0.9 mgd has been exceeded on only ten occasions, and then for only approximately three hours at a time. With four aeration tanks in operation twelve hours retention is provided for a flow of 0.6 mgd. The average daily flow has been below this figure for 36 weeks of the year. It was on the basis of these figures (expanded) that the decision to use only two aeration tanks was made.

In September of 1961, the Richmond Hill chief operator obtained a transfer to another OWRC plant and Mr. Stan Toye, formerly at North Bay, was engaged as chief operator for Richmond Hill. He is being assisted by a staff of four operators and is doing a good job of operating the plant. Some difficulties were naturally encountered with the change and were compounded by the change in aeration tank operation, but it is felt that these have been resolved satisfactorily.

During 1961, it was found that the sludge drying beds had become blinded with clay and subsequent investigation showed that the tile underdrains were surrounded by clay. Renovations of the beds would have been expensive and the close proximity of residences makes them somewhat objectionable. On this basis a decision was made to haul wet sludge away from the plant by tank truck. This was done on a purchase order basis but a contract is presently being prepared for tendering. This sludge haulage may present some increase in operating cost, but will, it is felt, prove more satisfactory to the Town and to the plant.

PLANT PERFORMANCE

As stated previously the total flow arriving at the plant during 1961 was 205.5 million gallons. On the basis of the recorded BOD and suspended solids content the sewage is of average domestic quality. The minimum recorded influent BOD was 55 ppm, the maximum was 295 ppm and the average was 165 ppm. The minimum, maximum and average suspended solids in the influent were 13, 294 and 179 ppm respectively.

The average reduction in BOD and suspended solids was 83% and 75% respectively.

Thus the quality of sewage and the reduction in BOD and solids obtained by treatment were average for an activated sewage treatment plant.

The cost of treating the total flow of 205.5 million gallons was $44,475.13. Thus, the cost of treatment was approximately 21.6¢/1,000 gallons. On the basis of a population of 17,200 persons the per capita cost of treating sewage was approximately $2.58 per year.

The operating costs were broken down as follows:

Payroll	47.5 %
Fuel	3.1
Power	10.1
Chemicals	8.2
General supplies	2.4

Equipment	1.0
Prepairs and maintenance	2.7
Sundry (includes sludge haulage)	25.0
	100.00 %

To the operating costs must be added a debt retirement payment of $7,192.00, a reserve account payment of $2,988.00 and an interest payment of $20,672.00 for a total of $30,852.00.

Therefore, the total per capita cost of sewage treatment in Richmond Hill in 1961 was approximately $4.38.

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